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MERGING CELLS AND THE 8,000 FT RUSTIC, COLORADO TORNADO OF JUNE 18, 1987

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On June 18, 1987, a tornado touched down in the mountains of north Colorado. It occurred eight miles south of Rustic, 40 miles west of Fort Collins in Larimer County, Colorado. The tornado, seen by many people, was 30 to 50 yards wide, toppled hundreds of trees and unroofed many buildings. The elevation in this area is around 8,000 ft. The development of this storm was detected by the WSR-74C, 5 cm radar at WSFO Cheyenne. The purpose of this paper is to document this event and to emphasize the development of the storm as seen by the Cheyenne radar.

The weather of that afternoon was conducive to tornadic development, and a tornado watch was issued by the National Severe Storms Forecast Center just north of Colorado. This watch included much of east Wyoming, west Nebraska and South Dakota, as well as parts of southeast Montana. The watch was effective from 4:00 p.m. MDT to 10:00 p.m. MDT.

Two cells of moderate (VIP-2) intensity formed just north and east of Rustic, Colorado by 1:30 p.m. MDT (Fig. 1). An hour later, Cheyenne radar indicated the southern cell had remained nearly stationary while the northern cell moved southeast (Fig. 2). Approximate tops of the two thunderstorms were from 30,000 to 35,000 ft. The two cells merged into one by 3:25 p.m. MDT, with a maximum intensity of VIP-3 (Fig. 3), and the height of the cell reached to 39,000 ft.

During the next hour, however, the cell completely dissipated and by 5:30 p.m. MDT the Cheyenne radar scan detected no echo in the vicinity. Did the merging cells have anything to do with the tornadic development?

Grebe (1982) summarized some earlier studies concerning merging echoes. While most studies found some evidence supporting tornadic development with strong merging cells, Lemon (1977) concluded that most severe weather was a result of the storm's character and not due to merger with other storms.

From this case, it is obvious the parent cell of the tornado formed from the merger of two lesser cells. However, the tornado formed at least an hour, if not longer, after the merger. The author believes that while the merger itself may not have caused the tornadic development, it did lead to the development of a cell which became tornadic.

References

Grebe, R., 1982: An outline of severe local storms with the morphology of associated radar echoes. NOAA Tech. Memo. NWS-TC-1, 77 pp.

Lemon, L. R., 1977: Severe thunderstorm evolution: Its use in a new technique for radar warnings. Preprints, 10th Conf. on Severe Local Storms, Amer. Meteor. Soc., Boston, MA, 77-80.

Storm Report, National Weather Service Forecast Office, Denver, Colorado, 7:00 p.m. MDT, June 18, 1987.

Fig. 1. Cheyenne radar showing two cells with maximum intensity of VIP 2.

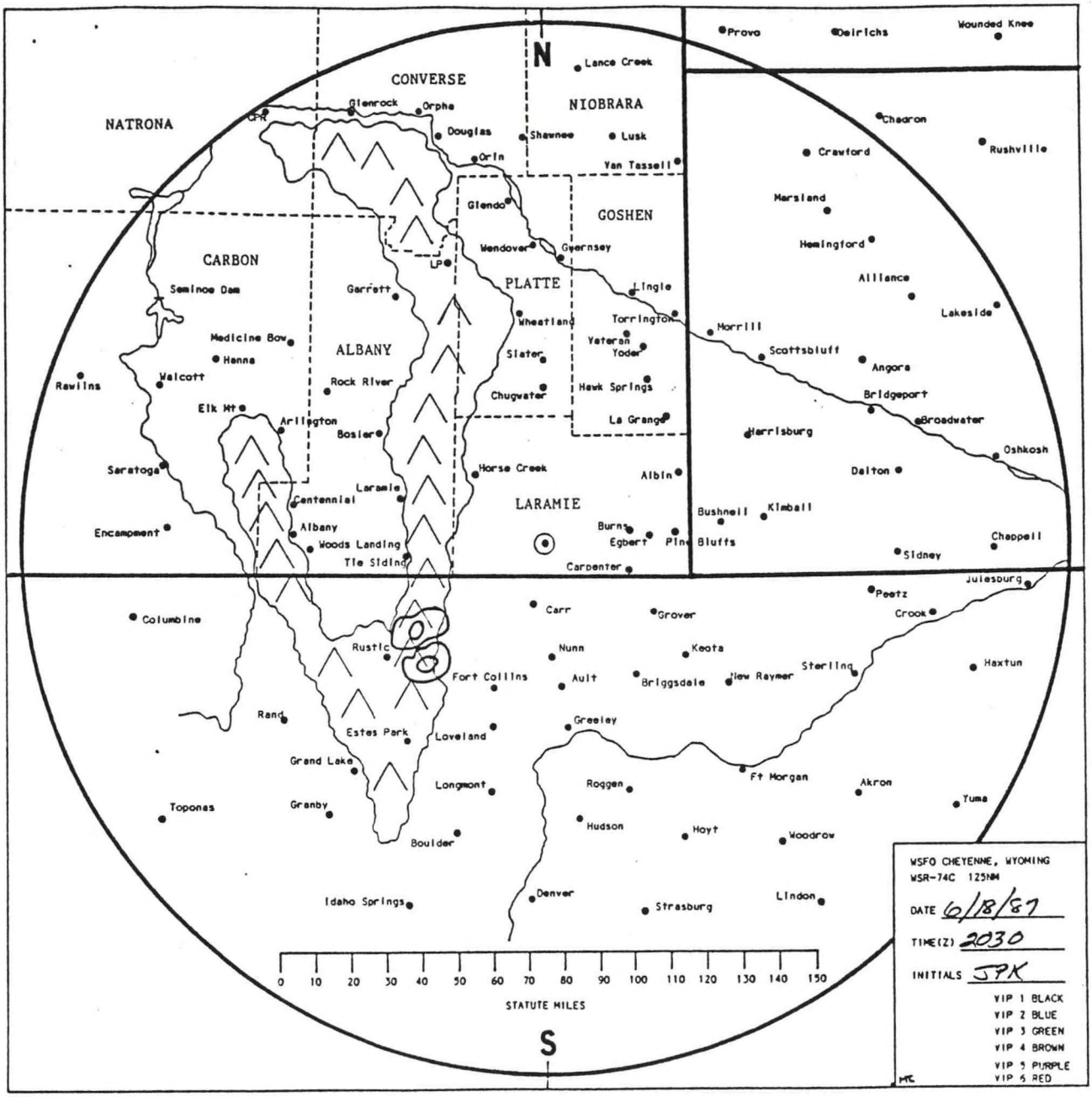

Fig. 2. Same as Fig. 1.

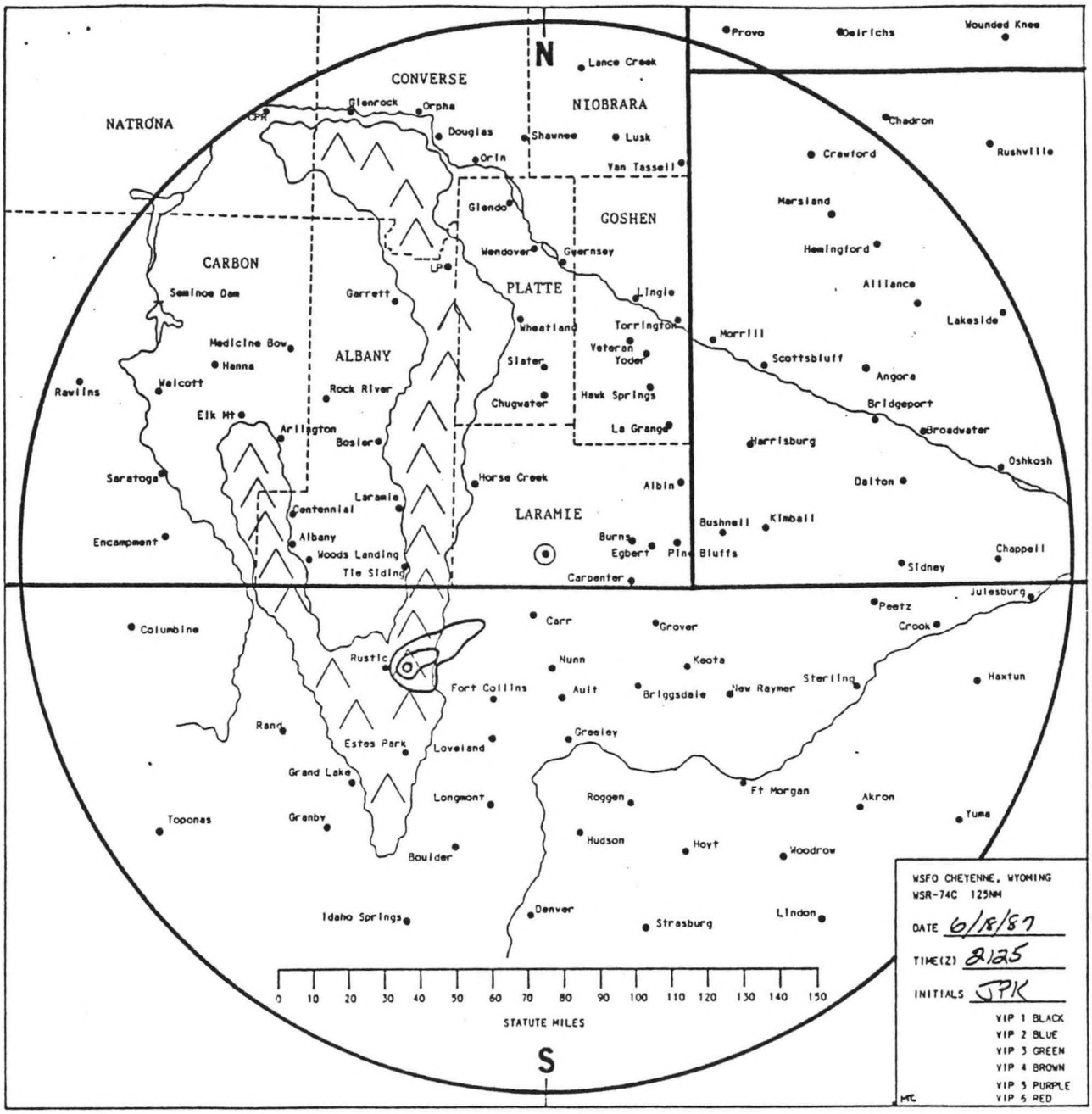

Fig. 3. Cheyenne radar showing merger of two cells with maximum intensity of VIP 3.